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ABSTRACT

The ease of authoring new computer materials for micros and pre-programed menu-driven systems, which allows classroom instructors to design programs directly related to classroom objectives and activities, has helped to alleviate the problems of software shortage for computer assisted instruction (CAI) in reading. One college instructor has developed a program for remedial reading students focusing on mastery of 20 commonly used Latin and Greek morphemes that were a roadblock to the students' vocabulary development. In developing the program, the instructor found several suggestions helpful for teachers interested in composing their own programs: (1) choose a system that is user and author friendly; (2) write out clearly defined objectives, and include remediation and feedback before writing the program; (3) when developing multiple choice test questions, leave "I don't know" as an option; (4) avoid degrading comments when writing feedback; (5) create a personal voice in the program; (6) write with the student audience in mind, and do not crowd the screen; (7) develop a corresponding test of no more than 20 items for each lesson; (8) provide developmental levels of instruction within the program to accommodate different levels of learners; (9) schedule a training day for student users so that they may learn to use the system independently; and (10) integrate the program into the total curriculum. (HOD)

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COMPUTER ASSISTANCE ACROSS THE SKILLS: VOCABULARY DEVELOPMENT THROUGH CBE

Paper presented at the National Council of Teachers of English Convention, November 20, 1983, Denver, Colorado

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COMPUTER ASSISTANCE ACROSS THE SKILLS:
VOCABULARY DEVELOPMENT THROUGH CBE

Since the pioneering work in computer assisted instruction (CAI) in 1960 with the Illinois PLATO project, the possibilities for educational computer applications have skyrocketed. During a mere twenty-five years, computerized learning expanded to include math, science, business, and now English and reading. The advent of the microcomputer, heralding a deluge of software, promulgated that the computer become a viable teaching tool. Yet, with a technological picnic basket of Apples and other tempting treats, educators now need to check their diets in the consumption of available courseware. In fact, according to a recent article in the Journal of Reading, the "most pressing need in CAI in reading is the development of adequate software." (Marsh) The ease of authoring new computer materials, especially for micros and pre-programmed menu-driven systems, allowing classroom instructors to design programs that directly relate to class objectives, materials, and activities, has helped to alleviate the problems of software shortage.

When the University of Northern Colorado purchased the PHOENIX CBE (Compter Based Education) system, which contained an easy authoring CAI/CMI format, I opted for a self-written computer program for my reading students, focusing on key Latin and Greek morphemes which I felt were essential tools for their learning but which also represented troublesome roadblocks to their vocabulary development. My CAI lesson, RVOCAB, and its sister component ID 104, the CMI test RVOCAB, allowed student flexible time for individualized learning and reviewing twenty commonly used roots and prefixes and insured a 90% student mastery level of those morphemes. The program, written for college freshmen in a

developmental reading course, supplemented the curriculum and provided a change of pace to reinforce classroom and lab activities. (As an aside, proponents of CAI note that culturally disadvantaged learners benefit from computer instruction (Marsh); I add that educationally disadvantaged students likewise enjoy and benefit from computer interaction.) In the rest of this paper I shall describe the main features of my vocabulary CAI/CMI program, sharing some personal observations about authoring CBE materials.

First of all, the CBE system I utilized was PHOENIX, developed by Goal Systems of Columbus, Ohio, which was linked to the university's IBM 3031 mainframe. Although the initial time in scripting the program encompassed a span of six months, the overall advantages in utilizing the system included many:

1) The only language I needed to know for authoring the system was English.

2) The system is userfriendly; that is, the students did not need to learn a complicated set of codes to operate the system.

3) The system has a capacity for 660 students, with the potential of expansion to 9,600. That certainly accommodated all the students that I could possibly persuade to sign up for reading.

4) The University of Northern Colorado purchased the system ($20,000) and provided terminals, located in the computer centers and library, free of charge to faculty and students. Not only did this allow easy access to the terminals during many hours of the day and evening, but their university-wide availability did not create a financial burden to the department budget.

5) For each instructional course program, the system has the capacity of 26 units or lessons, 32 objectives for each of these units, three levels of difficulty for each instructional item, with the potential of 99 frames per item. Therefore, the system had more than the capacity I needed for my lessons.

(For those of you who revel in computer capacities, the present capacity of PHOENIX is 32, 400 blocks, each block having 512 bytes.)

6) The system provided both a CAI and a CMI component. As a result, I could test my students in a manner compatible to the CAI lesson format.

7) I was freed from the scoring of the lessons, test-giving, and record keeping for both RVOCAB and ID 104 and could therefore spend more of my time in matters much less mundane.

8) The CMI component allowed the students a chance to re-take the test as many times as needed to achieve mastery level. Since the computer scrambled and randomly picked twenty test questions from a bank of two hundred for the pre- and post-tests, no two CMI tests appeared alike, thus allowing for test equivalency.

9) As an author for the program, I enjoyed various rights, such as managing course security, allocating space for other instructors to use the course (if I permitted them to do so), and implementing course content.

Some freedoms which I came to enjoy as an author for a computer program versus a pen-and-ink paper lesson included easily editing lines and frames; if I wished to transcend the limits of time, writing five frames a day or fifty, the computer made no irreverent remarks about my creativity or productivity, nor did a typist mind my sudden changes in thought or endless editing. The computer program allowed for revision.

Since a major emphasis of my reading course focuses on vocabulary improvement, I chose a program related to this topic to reinforce some of the ideas discussed in the class. However, since writing a CAI package represented a new venture and my neophyte computer skills demanded a realistically manageable topic, I chose the identification and definition of commonly used Greek and Latin morphemes as my topic, creating a file of over two hundred words that ranged in difficulty from

easy, to medium, to hard. Level A words, described as easy, such as recreation, prehistoric, and export, denote words in general use. Level B words of medium difficulty, such as precocious, incognito, and unruly, describe words familiar to many college freshmen. On the other hand, Level C words, such as orthography, vertigo, and sublimate, provide a vocabulary challenge to most college freshmen. The RVOCAB CAI program presents both explanations of word derivatives and corresponding multiple choice test questions. In the RVOCAB program the student also receives feedback about program responses, reinforcing correct ones with additional description and examples. When the student makes an incorrect response, the student is permitted to choose another answer; in fact, the studert is not allowed to continue to the next instructional item until the correct response is made. The RVOCAB program features two main objectives: defining a specific morpheme and, secondly, identifying that morpheme in a Level A, B, and C word. In the future I would like to add a third objective involving the application of these morphemes to unfamiliar words similar to the use of etymology to define a new word. As a response to these two objectives, I created two separate units: A- Defining Greek and Latin Roots and B- Getting To The Root Of It.

The matching ID 104 CMI test likewise uses the same unit titles, objectives, and instructional items. The computer, however, randomly picks twenty multiple choice test questions from the bank of two hundred questions. As a contrast to RVOCAB, though, the student may pick only one response per item, with no corresponding feedback or explanation. Each student must take the ID 104 pre-test, and at the end of the RVOCAB lesson, the ID 104 post-test. In each test, mastery level is 90%, with higher weights given to Level C, then Level B words. If the student does not achieve mastery level, then the computer does not acknowledge the student's completion of that test. At the end of the quarter when I review the class profile sheets, I note whether or not the student achieved mastery.

In developing each CMI and CAI lesson, I found that the key to authoring the program was outlining. The PHOENIX system,

a menu-driven system, aided in the development of that outline by requiring that pre-scripted courses, units, lesson objectives, levels of mastery, and instructional items be clearly specified. A flowchart, noting sub-levels and branches in the program, helped in constructing a visual aid describing the relationships between objectives and items.

On the whole, I found that authoring a CBE program through PHOENIX was a new mode for communicating to my students information that could be regarded as simplistic, lower-level comprehension routines. The computer exercises represented good warm-ups in language awareness for further body building in vocabulary usage. The students welcomed the change of pace of instructional presentation and enjoyed the hands-on interaction with the computer. However, unless additional follow-up activities integrated the CAI program with the classroom activities, such as discussion, related compositions, or applications in contextual samples, the overall benefit of the CAI program was minimized. Therefore, additional reinforcement of the twenty morphemes presented in RVOCAB through class and home assignments assisted in the students' confidence and expertise in using them.

During my self-induced trials in authoring the program, I discovered a few hints in writing a CAI/CMI lesson that I would like to share; these tips can be applied for authoring any instructional package:

1) Choose a user friendly system.

2) Likewise, choose an author friendly system. Become familiar with the computer codes for entering data and for manipulating the various commands.

3) Before writing any program, write out clearly defined objectives, script the instructional items, and develop a flowchart to note the sequencing and sub-sequencing of information. Include feedback and remediation.

4) In developing multiple choice test questions, which have been proven to be valid as a computer feedback response in checking comprehension, leave "I don't know" as a viable option. Include hints when appropriate.

5) In writing feedback, avoid degrating comments; instead, accent the positive and use humor when appropriate.

6) Create a personal touch. One advantage of a computer is that the author can enjoy the use of the second pronoun "you." A tutorial dialogue creates a more friendly environment for the student.

7) Use your own creativity, personality, and scribal fluency. The computer becomes an extension of the author's expressiveness.

8) Write for your audience. Avoid using fancy jargon or over-inflated sentences. For adult readers, it is recommended that a 10th grade readability is used. However, in writing vocabulary programs, since much of the material should be a verbal challenge, I suggest that a simple style should be used.

9) In creating the program, be item specific. In other words, the instructional frames with the corresponding multiple choice test questions constitute the primary meat of the program.

10) Create a test item after two or three instructional frames to let the student interact with the program. Unlike a book, the computer has the capacity for immediate feedback in checking comprehension.

11) When entering the script, do not crowd the screen with extended paragraphs. Keep the narrative easy to read visually as well as semantically.

12) Write clear introductions for using the program.

13) Provide follow-up instructional materials and activities to the program.

14) For each CAI lesson, provide a corresponding CMI test of no more than 20 test items.

15) Keep the CAI program short so that the student can finish it within 20 to 30 minutes.

16) Provide levels of instruction within the program to accommodate different levels of learners.

17) Schedule a training day for student users so that they may learn how to independently use the system.

18) Integrate the program into the total course curriculum.

In conclusion, an individually authored CAI/CMI program incorporates the best of individualized self-paced learning with the best of interactive reinforcement of course goals and objectives. The choice of topics for computerized instruction in any of the skills, including vocabulary development, is limited only by the author's range and depth of expertise in manipulating a CBE system. Like the phoenix in ancient mythology, the PHOENIX CBE system represented to me a way to recreate new life in instructional format, giving birth to new ventures in learning.

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